Figure 1

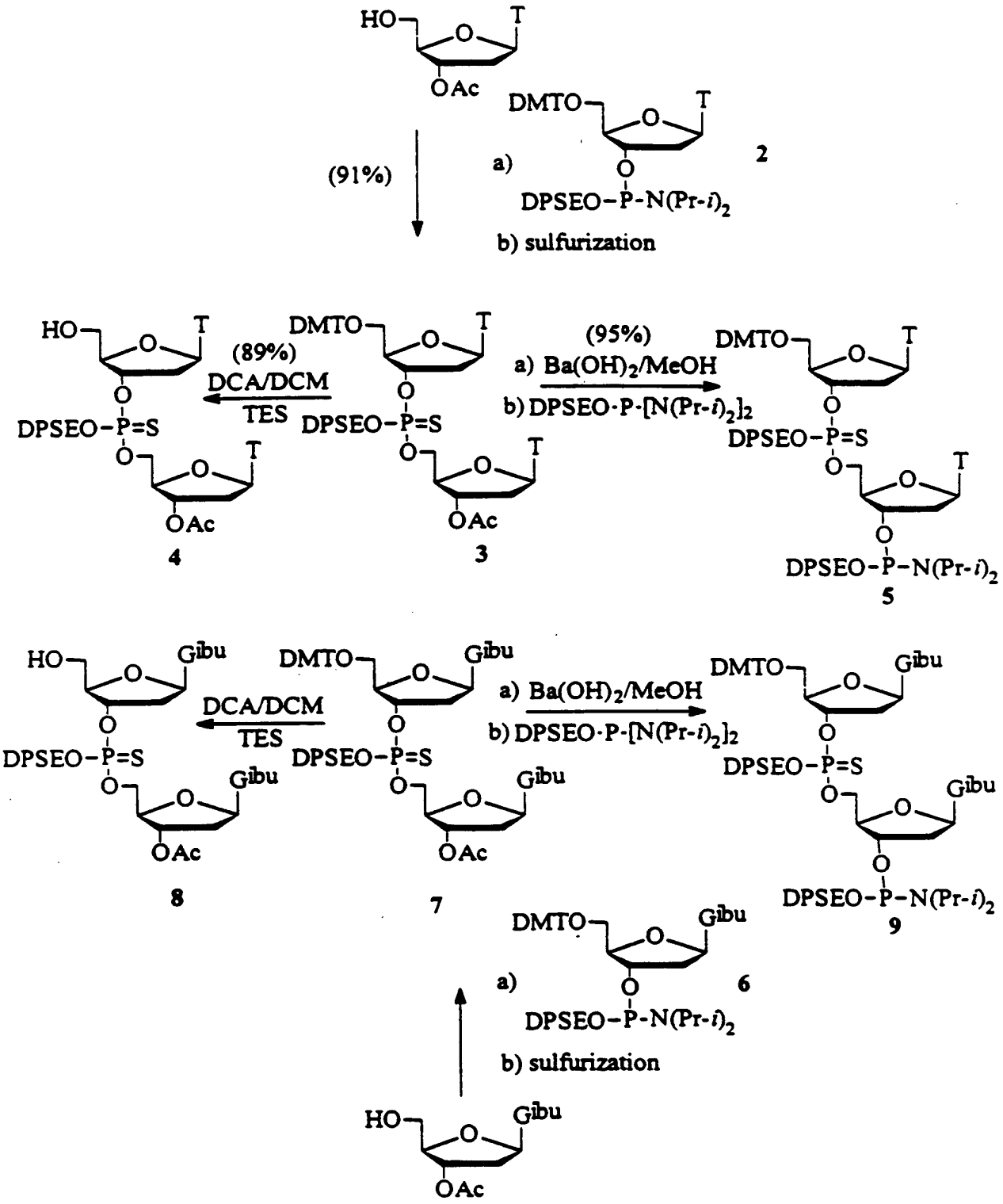
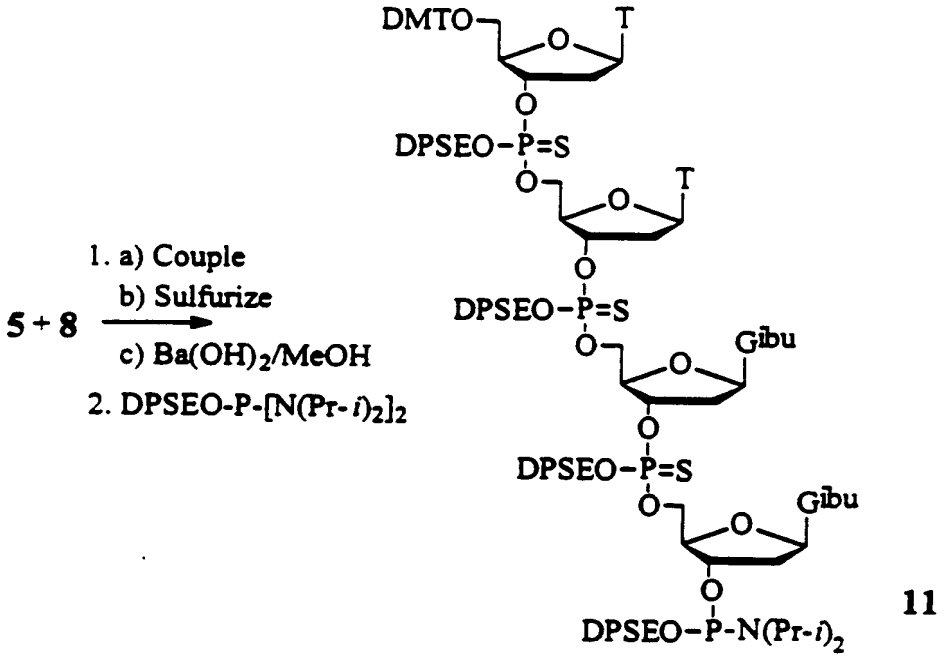

HO
T
O
OAc
DMTO
T
O
2
a)
O
DPSEO–P-N(Pr-i)2
(91%)
b) sulfurization
HO
T
O
DPSEO–P=S
O
T
O
OAc
4
(89%)
DCA/DCM
TES
DMTO
T
O
DPSEO–P=S
O
T
O
OAc
3
(95%)
a) Ba(OH)2/MeOH
b) DPSEO·P·[N(Pr-i)2]2
DMTO
T
O
DPSEO–P=S
O
T
O
DPSEO–P–N(Pr-i)2
5
HO
Gibu
O
DPSEO–P=S
O
Gibu
O
OAc
8
DCA/DCM
TES
DMTO
Gibu
O
DPSEO–P=S
O
Gibu
O
OAc
7
a) Ba(OH)2/MeOH
b) DPSEO·P·[N(Pr-i)2]2
DMTO
Gibu
O
DPSEO–P=S
O
Gibu
O
DPSEO–P–N(Pr-i)2
9
DMTO
Gibu
O
a)
O
6
DPSEO–P-N(Pr-i)2
b) sulfurization
HO
Gibu
O
OAc

Figure 2


DMTO
T
O
DPSEO-P=S
Gibu
1. a) Couple
b) Sulfurize
5 + 8
c) Ba(OH)2/MeOH
2. DPSEO-P-[N(Pr-i)2]2
DPSEO-P-N(Pr-i)2
11

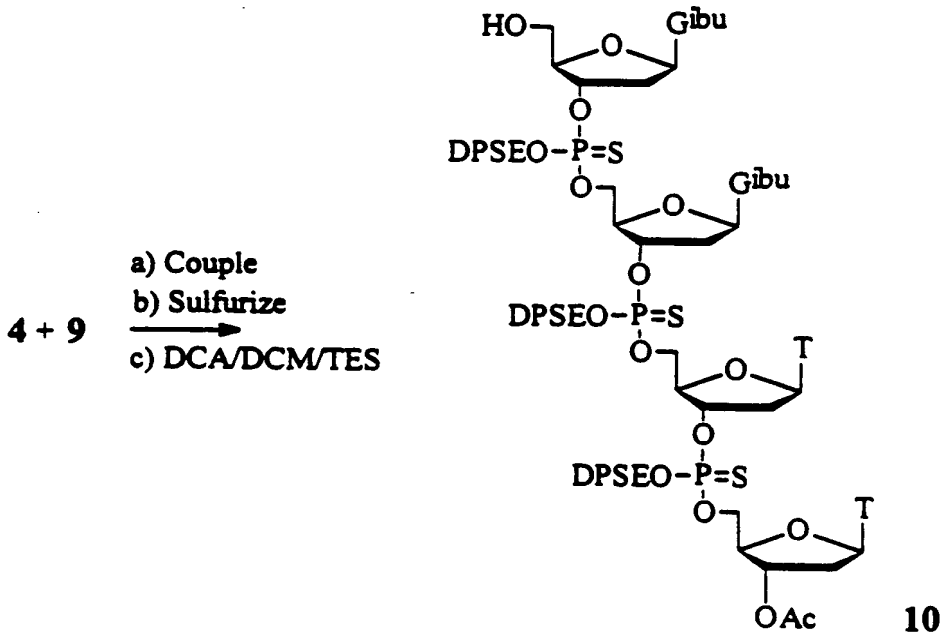
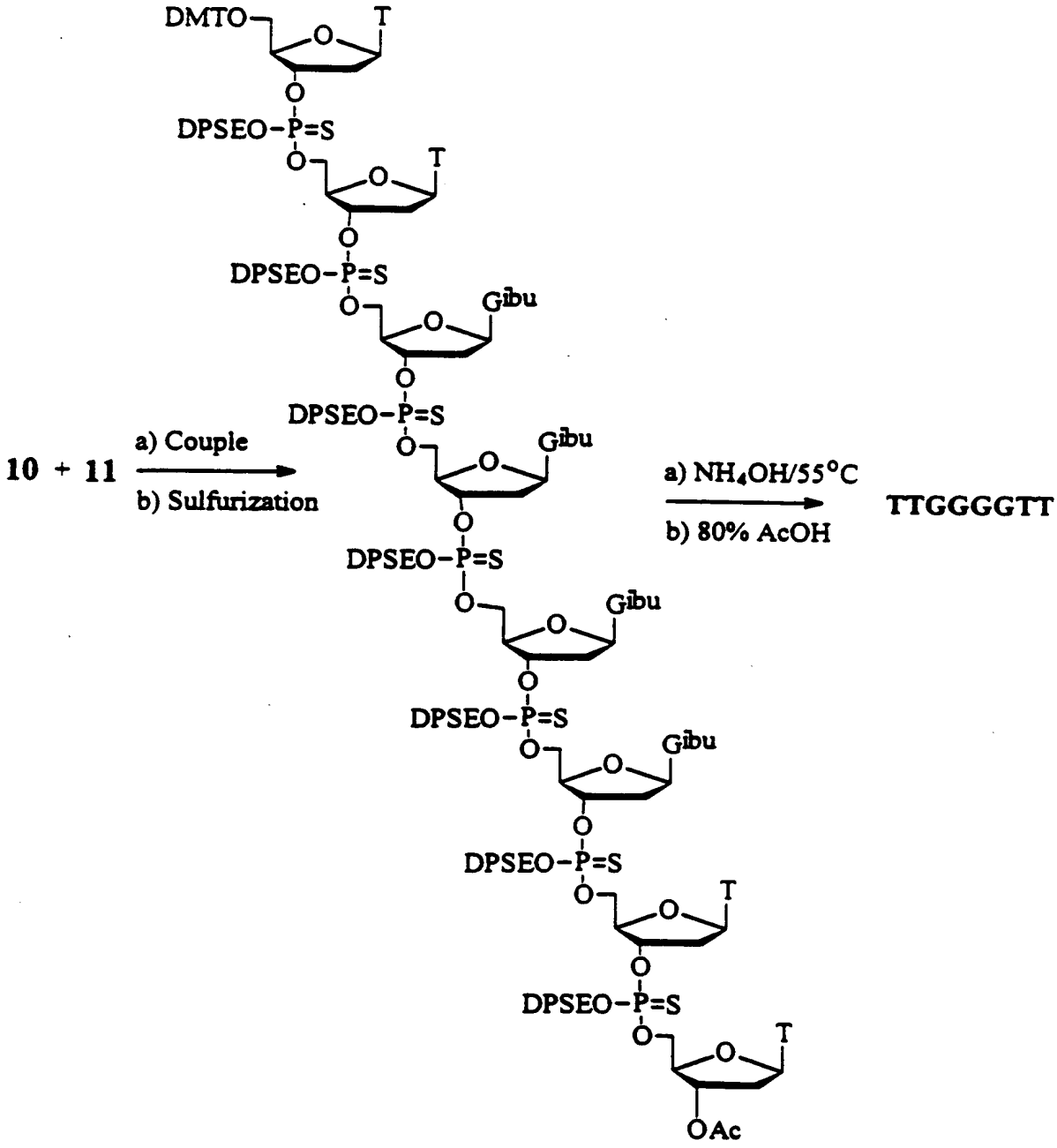

HO
Gibu
DPSEO-P=S
T
a) Couple
b) Sulfurize
4 + 9
c) DCA/DCM/TES
OAc
10

Figure 3


DMTO
T
O
DPSEO-P=S
Gibu
10 + 11
a) Couple
b) Sulfurization
a) NH4OH/55°C
b) 80% AcOH
TTGGGGTT
OAc